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THE SHIPPING BALANCE.

Britain's shipping position was, on the eve of the second world war, decidedly weaker than in 1914. More dependent upon imports, which had risen from 52.8 million tons in 1913 to 67 million tons in 1938, her merchant fleet had shrunk, total British seagoing tonnage in June 1938 being 17.7 million gross tons as against 18.9 million gross tons in June 1914. The naval problems of this war have also been more difficult than the last, especially since the collapse of France; moreover the long distance bomber has added an extra burden to the defence forces. In the following article we shall attempt to estimate the shipping position in September, 1942, to balance losses and gains of the United Nations.

TONNAGE POSITION. THE BALANCE OF LOSSES AND GAINS.

(i) *Shipping Losses.* Table I shows the losses through enemy action of British, Allied and neutral shipping up to the end of 1941.

TABLE I.

Losses of British, Allied and Neutral Shipping through enemy action (000 *gross tons*)

1939 (4 months)		742
1940		3,784
1941 (first 6 months)	2,579	
1941 (last 6 months)	(1,197)[1]	
1941 (total)		(3,776)[1]
Grand total up to end of 1941 ...		(8,300)[1]

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[1] Figures for the last 6 months of 1941 and grand total are taken from the Report of the Chamber of Shipping of the U.K., Annual Report 1940—1941, p. 87. These figures do not include military and auxiliary vessels lost. The Chamber of Shipping estimated these at 300,000 gross tons up to the end of 1941. In 1942 further military shipping was lost at Singapore, Malta and on other convoy duties. The tonnage cannot have been considerable enough to alter the picture.

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EDITORIAL NOTE.

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After December 1941 we pass into a world of surmise, hints and rumours. We can, however, get some idea of losses in the first 8 months of 1942 from official statements. According to Sir Arthur Salter[1] the building figure of the United Nations first exceeded sinkings in September 1942. Total building in the first 8 months of 1942 was some 7 million deadweight tons, or about 500,000 gross tons a month. Launchings in September, when, according to Sir Arthur Salter, there had been a slight net improvement in the tonnage position, were between 750,000 and 800,000 gross tons. American sources reported, moreover, that sinkings in the month of June were heavier than at any time in the first and second world wars.[2] Maximum monthly losses in that war were suffered in April 1917 at 867,000 gross tons. Official statements make it clear, however, that sinkings had fallen below the level of the early summer of 1942.[3] On the other hand, the suddenness of the Japanese attack must have resulted in the loss by capture or sinking of a considerable amount of United Nations shipping in the early months of 1942.

An average monthly loss of between 6—700,000 gross registered tons and a total loss through enemy action in the first 8 months of 1942 of between 4.8 and 5.4 million gross tons seems a conservative estimate. This would give a cumulative total loss for the first three years of the war of between 13.4 and 14.2 million gross tons.

(ii) *Marine Losses* are excluded from these statistics. During the first world war British marine losses averaged some 250,000 tons in the first two years and between 350 and 450 thousand per annum in the second period after the institution of convoys. The initial rise is explained by navigation without lights, the further increase is due to the increased risk of collision in convoys. As convoys were instituted at the outbreak of this war, marine losses ought not to be put lower than the figures derived from the statistics of 1917—18. Indeed, as convoys were larger in this war they ought to be put somewhat higher.[4] Allied and U.S. losses prior to their respective involvement in the war ought to be put lower. On this basis the marine losses of the Allies in the first three years of the war can be estimated at between 1.4 and 1.9 million gross tons.[5]

(iii) *Repairs.* Apart from the tonnage permanently lost a number of ships are temporarily incapacitated by damage. According to Sir

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[1] Broadcast of 27th September 1942. Reported in 'The Times.'

[2] 'Time' News Magazine, 6th July, 1942, p. 5.

[3] On the other hand, Sir A. Salter's statement makes it clear that in July to August losses were higher than building, i.e. *higher* than an average of roughly 580,000 gross tons, on the basis of official U.S. statistics and assuming British and other Allied building at the rate of 220,000 dw. tons per month on the basis of an article in the 'Economist', April 4, 1942, itself based on the 'Shipping World' (of January 14, 1942) and a statement of Mr. Attlee in Liverpool on March 22, 1942. The *Evening Standard* reported (January 23, 1943): 'Authoritative quarters in London said to-day that the problems of U-boat warfare were just as important six months or a year ago as they are to-day. Nothing special like any great *increase* in sinkings had occurred during the last six months.' This gives some indication of the order of magnitude of the problem to-day.

[4] The recent increase in sinkings having been due to submarine attack the ratio can be assumed to be constant.

[5] U.S. figure for the first two years at 20—40,000 tons, third year 120,000. Allied (increasingly in convoy) at 40—80,000 tons in the first year and at 100—150,000 subsequently.

Arthur Salter the stock of tonnage under repair or remodelling on June 31, 1918, amounted to 2.4 million dead weight tons, or 8% of total tonnage. In the first half of 1917 total damage amounted to 22%, in the second half to 20% of sinkings.[1] The overwhelming amount of ship losses was then caused by submarines ; during this war the importance of the aeroplane as a commerce destroyer has increased. Hence the ratio of damages to sinkings must also have increased. This is confirmed by inspired reports on repairs which are said to have totalled 8 million tons up to early 1942.[2] A comparison of this figure with the sinking figure suggests that the two were about equal. On the other hand, owing to the gradual improvement of repairs, including the use of U.S. shipyards for repair work under lend-lease, the less serious nature of damage, the ratio of total damage to shipping under repair must have fallen considerably ; we might take the same ratio of repair to total tonnage as in the last war, or some 8 per cent. of shipping immobilised on account of damage at any time. This would give a figure fluctuating between 1.6 and 3 million gross tons during this war.[3]

(iv) *Building.* Shipbuilding output in Britain, according to the *Shipping World*,[4] amounted to 1.75 million gross tons from the outbreak of the war until the end of 1941, an annual rate of 0.75 million gross tons. At the beginning of 1942 it increased to over 1 million gross tons per annum.[5] In 1942 the completion of 1.2 million gross tons per annum was hoped for. Total British output for the first three years of the war can be put, therefore, at between 2.4 and 2.55 millon gross tons.

Total U.S. output in the same period amounted to 3.7 million gross tons (of which 2.5 million gross tons in the first 8 months of 1942). Canadian and other output might be put perhaps at between 600,000 to 1 million gross tons. Total replacement of ships during the war amounts thus to between 6.7 and 7.2 million gross tons.

TABLE II.

Balance of Losses and Gains, September 1939 *to September* 1942 (*gross tons*).

Losses due to enemy action ...	13.4—14.2
Marine losses	1.4— 1.9
Ships under repair	1.6— 3
Losses due to all causes ...	16.4—19.1
Replacement building ...	7.2— 6.7
Net Reduction	9.2—12.4[6]

The effective net reduction of shipping at the disposal of the United Nations is thus of the order of 9—12.5 million gross tons.[7]

(v) *Total tonnage.* The British merchant fleet amounted before the war to 17.9 million gross tons, that of the Empire to 2.7 million and the U.S. fleet (excluding lake steamers) to 9.4 million gross tons[8].

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[1] Lloyd George, War Memoirs, Cheap edition, p. 676.

[2] *Financial Times*, January 29, 1942.

[3] *Economist*, August 29, 1942, p. 274.

[4] January 14, 1942.

[5] *Economist*, April 4, 1942, quoting Mr. Attlee.

[6] At the end of 1917 the gross loss in world tonnage was 11 million ; net loss 6 million gross tons. Salter op. cit. p. 285.

[7] According to Lord Hankey ' our losses during the war are more than double the replacement.' (*Sunday Times*, Jan. 3, 1943, ' Outlook for 1943 '). If we exclude repairs, not mentioned by Lord Hankey, his statement wholly confirms our estimate

[8] Chamber of Shipping of U.K. 1939/40 table facing p. 117.

According to the *Economist*[1] the overrunning of neutral countries by the Nazis resulted in the acquisition by the United Nations of the greater part of their merchant tonnage. The tonnage accruing from this source is estimated at 7.6 million gross tons.

In this figure 2.5 million gross ton losses suffered by 'Allies' and 'neutrals' up to the middle of 1941 might be at least partially discounted.[2]

A total addition from other sources (including French ships in U.S.) of between 900,000 to 1,250,000 gross tons does not seem an unreasonable guess. Panamanian, Brazilian etc., shipping at the disposal of the United Nations may be something like 0.5 million tons.

The total shipping, exclusive of losses suffered,[3] of the United Nations therefore amounted to some 39.0 to 41.4 million gross tons.[4] Up to the beginning of September 1942 the *net* loss was between 9.0 and 12.5 million tons, or about one quarter of the total and thus the total tonnage might be estimated at between 26.5 and 32.5 million gross tons. This tonnage is about the same as that which was used to stem the German offensive in 1918 (about 27 million gross tons).[5]

TONNAGE AND IMPORT CAPACITY.

The import capacity of the United Nations will depend not merely on the total tonnage available, but on the proper utilisation of that tonnage. This requires not only that the resources of manpower and material within each separate country should be adjusted correctly for the needs of the war, but that the resources of the whole United Nations should be covered by a unified plan, to make the best use of the scarcest single factor, shipping.

The ratio of import capacity to tonnage was in January 1916 4 : 1.[6] By the middle of 1918 this had increased to 5.9 : 1 and in the last months of the war to 7.2 : 1.[7] In some respects, however, the shipping problem is more awkward in this war than in the last. Firstly, the increase in the average length of voyage after the Nazi occupation of the whole Atlantic seaboard of Europe was considerably greater than anything experienced in 1914—1918. Against this, the introduction of Lend-Lease made possible a fuller use of U.S. supplies and a concentration on the shortest supply routes. In 1940 the effect of increases in voyages in reducing import capacity was put at 30%,[1] though in view of the cumulative changes of that period, a higher figure, say 50%, seems now a better estimate. For non-military traffic considerable improvement has occurred since 1940, by concentrating on supplies from the U.S., despite the necessity to avoid the waters near Africa.[2]

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[1] May 2nd, 1942.

[2] According to Lloyds Register the pre-war merchant fleet of the countries concerned amounted to 13.5 million register tons. Mr. Churchill alluded on August 20, 1940, to 'at least 4 million tons of shipping from captive countries under our control' (Hansard Col. 1164—74). Mr. Cross gave an identical figure plus purchases of 1.25 million tons (Nov. 12, 1940, Col. 1604). Mr. Churchill on Nov. 5, 1940, gave assurance that the merchant fleet was very nearly as large as at outbreak of the war, and over and above this there was a great deal of neutral shipping (1243). The difference might be accounted for by tankers, of which Norway alone had 2.1, Holland 0.5, France 0.3 and Denmark 0.1 million tons or a total 3 million tons, much of which must have been abroad. The rest of the difference is more than accounted for by the Greek figure. If this is not the explanation shipping figures must be reduced by some 2.5 million gross tons.

[3] This shipping was never 'at the effective disposal' of the United Nations, as the British merchant fleet was seriously reduced before the U.S. fleet came into the war.

[4] Assuming for the higher figure that 2 million gross ton sinkings were already excluded from the figure of 7.6 million for Allied Shipping.

[5] *Cf.* Salter, 'Allied Shipping Control,' p. 364.

[6] Salter, ibid. p. 65.

[7] Salter, p. 354, Table 5, and p. 364/5, Tables 11 and 12.

Secondly, the institution of convoys was immediate and had to be extended, partly because of technical improvement in U-boat warfare, and partly because of the weakening of the strategic position in the Atlantic in 1940, and in the Pacific and Indian Oceans in 1942.

The net effect of instituting convoys in reducing tonnage utilisation was estimated at the end of 1940 (including damage to ships and docking difficulties) at 25 per cent.[3] This also seems an underestimate. The Liverpool Steam Ship Owners Association puts the loss of carrying capacity due to convoys alone at 30 per cent.[4] This estimate in conjunction with the loss of efficiency due to lengthened voyages seems to accord with Lord Essendon's statement that ships at the moment could average three voyages a year only, or a diminution of 25 per cent., as contrasted with the lowest figures of the last war[5] or almost $\frac{1}{2}$ as contrasted with the middle of 1918.[6] With the transfer of U.S. destroyers, new building, the acceptance by the U.S.A. of the task of escorting vessels to the mid-Atlantic the escort position improved. Their entry into the war has once more worsened the position temporarily though the building programme also increased thereby.

Thirdly, available shipping is not homogeneous ; only a part of total tonnage is suitable for the transport of cargo. According to Mr. Isserlis in 1936 only 12.7 million gross tons of shipping were used in general foreign trade, which excludes 4.4 million gross tons.[7] Since then tonnage increased by 0.8 millions. If we exclude tonnage under 1000 tons of the Allied ships, corrected for the partial transfer of shipping, another million tons must be deducted. Non-British tankers of the world, exclusive of the Axis, represent some 7.6 millions of which perhaps 5.0—5.5 millions might have been included in the global figure.

The exclusion of some 10.6—11.1 million gross tons of shipping as 'non-effective' seems justified. The effective shipping (excluding tankers) of the United Nations therefore—if the same average loss ratio in the excluded categories is assumed—is between some 16—22 million gross tons.[8] The loss of faster and bigger ships, which seems to have been more in proportion to total losses because they were used on dangerous voyages, would affect import capacity more severely than an identical loss in tonnage sustained in smaller and slower vessels.

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[1] Professor D. H. Macgregor, 'Aspects of the Shipping Question,' BULLETIN Vol. 2, No. 11.

[2] The events in North Africa may reverse this state of affairs. It may also reduce the military traffic, which since 1940 had increased on the longest routes.

[3] Professor Macgregor, ibid.

[4] *Manchester Guardian*, 13 March, 1941.

[5] Ibid. 28 February, 1941 ; also 30 July 1942.

[6] Under the assumption that the weight of imports per unit of shipping space did not change between 1916 and 1918.

[7] Journal of the Royal Statistical Society, 1938, p. 102. Of this 0.75 million gross tons were passenger liners. Tankers (excluded) represented 2.2 million gross tons. These increased to 2.9 million by 1939.

[8] The comparable figure for October 31, 1918, is between 26.6 and 27.2 dw. tons or roughly between 17.7—18.1 million gross tons. Out of this 2 million dw. tons were in the colonial service of the chief powers. This must have increased considerably owing to the aggression of Japan. It might be guessed at between 2.5—3.5 million gross tons.

Finally, the loss of ships with cargoes is more serious than that of ships leaving the country in ballast or lightly loaded. The loss of outward bound munitions is much worse than inward bound convoys. The losses figures do not differentiate between sinkings, nor does the net tonnage replacement figure show the loss of cargo and of time needed to replace merchandise at any given destination port. No estimate is possible of this factor : unlike the last war there seems to be no reason for a bias in sinking between inward and outward bound ships.

On the other hand there were several factors which influenced total import capacity favourably : requisitioning and rationalisation of British shipping were prompter than in the last war. The gradual reorganisation of unloading facilities in ports and the planning of cargoes to facilitate unloading has undoubtedly speeded up the turn-round of ships and increased the efficiency in shipping. The better use of cargo space and the relaxation of loading regulations must certainly have produced large savings. Again in contrast with 1914—18 the basic needs of France and Italy are not a charge in the United Nations tonnage, which means a net relief of some 4.5 million gross tons.

Not all effective shipping however is available for importing. We must take into account the direct shipping requirements of the fighting forces. In an interview published in the British Press Col. Ross[1] assumed that the movement of 125,000 men with equipment would demand 2 million tons (he did not explain whether gross or dead weight tons were meant) i.e. 16 tons per man. It has been stated in U.S. that some ⅓ to ¼ of the U.S. ocean going shipping space has been requisitioned by the fighting services, or perhaps some 2 to 2½ million tons. To this, however, we have to add an unknown and probably substantial tonnage used for the transport of war material to the different bases. In view of the commitments of the U.K. in Egypt and elsewhere it would seem improbable that, excluding tankers, less than 5—6 million gross tons of shipping are required for this purpose. On the return voyage all these ships (excluding troop ships) can load merchandise except generally between U.K. and U.S. This factor can therefore be taken into account by reducing the tonnage while leaving the efficiency ratio of total shipping higher (due to the concentration of the pure ' merchandise ' ships on the North Atlantic).

CONCLUSION.

The actual import capacity of the U.K. cannot be estimated. It remains, necessarily, a secret. Some guess at the order of magnitude can, however, be made if the ratios given by Sir Arthur Salter (op. cit. p. 364) for the distribution of shipping between different services at the end of October 1918 are used. The difference between that and the present position is obviously very great. The proportion of shipping available for import services was higher as the Pacific was at peace and a second front was in being in Europe. Thus a calculation on that hypothetical basis will give an indication not of the *actual* shipping position but only of a theoretical maximum import capacity. On this basis shipping used for non-import services, assuming an effective tonnage, excluding tankers, of between 19 and 20 million gross tons, would be between 11 and 12 million gross tons. Assuming, moreover, an all-in efficiency ratio of 4 : 1 the order of magnitude of British import capacity would be between some 28 and 32 million tons without allowing for lost cargoes.[1] This is a figure somewhat below the effective imports in 1917. Yet if Lord Woolton's recent statement that half of our seamen are engaged in bringing food, and half of that food is wheat, is an indication of the utilisation of the total United Nations' shipping pool, that means that the proportion of food to munition imports is much higher now than in 1917. Appreciable further improvement could be secured by further economic measures, especially in food and agricultural policy, which would enable the United Nations to divert the whole of the probable net increase in shipping to military purposes instead of using it, at least partially, to maintain current consumption and to fill up the British stocks, which according to the U.S. Secretary of Agriculture have been drawn upon as a result of the diversion of shipping from the import service.

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[1] *The Times*, 16 September, 1942.

United Nations shipbuilding in 1943 may be expected to reach 14 million gross tons. Even if sinkings do not improve as compared with the first 8 months of 1942 this means an addition to carrying capacity of between 5.5 and 7 million gross tons, i.e. about 25 and 30 per cent. of present capacity. It must, however, be expected that, as on previous occasions when suffering military reverses, the Germans may intensify the U-boat warfare. Reports of increased U-boat building suggest this (average monthly sinkings in 1942 were estimated at over 600,000 as against 400,000 in 1941 and 200,000 in 1940). On the other hand it is to be hoped that the countermeasures of the new Anti-U-boat Warfare Committee will be more effective than those of previous committees. It is on that side even more than pure economic policy that remedial measures are urgently needed.

T. BALOGH.

EARNINGS OF WORKPEOPLE IN 1938 AND 1942.

The Ministry of Labour's latest enquiry into the earnings of workpeople relates to the total wages, including overtime and bonuses, received in the week ended 18th July 1942. The results, which are here reviewed, cover about 6¼ million workers and may be taken as representative of those industries which are included. Of the industries falling outside the scope of this, and of the similar previous enquiries, the more important are: agriculture, coal mining, railways, shipping service, the distributive trades, catering and domestic service.

The average earnings of men, boys (under 21), women, girls (under 18) and of all workers together, in July 1942, are shown below, together with the average percentage increase since October 1938. The comparison between the two dates depends, to some extent, on the method by which the earnings in different industries are combined to form the general averages; if they are weighted according to the numbers actually employed at each date, the percentage increase is larger than if weights are derived from the numbers employed in 1938, because of the increase in the proportions employed in the higher paid industries.[1]

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[1] A full account of which is given in *The Ministry of Labour Gazette*, December 1942.

EARNINGS OF WORKPEOPLE IN THE MAIN INDUSTRIES.

	Men	*Boys*	*Women*	*Girls*	*All*
	s. d.	s. d.	s. d.	s. d.	s. d.
Average earnings, July 1942	111 5	46 2	54 2	30 3	85 2
Percentage increase since October 1938 :—					
1938 weights	53	69	51	59	—
Current weights	61½	77	66½	63½	60

The increase in earnings is noticeably greater for boys than for others, partly because some are employed on work formerly done by men ; this also true of many women.

In these averages, two part-time women workers, employed for not more than 30 hours a week, are taken as representing one full-time worker. Their average earnings (unweighted) in July 1942 were 25s. 2d. per week. It is stated that, if part-time workers had been excluded, the average earnings of all women at this date would have been increased by 2d., those of all workers by 3d. Since each figure is presumably estimated to the nearest penny the difference may be anything between 1d. and 3d. in the one case, between 2d. and 4d. in the other. It follows that, in the specified industries, the number of part-time women workers is between 4.0 and 11.9% of the total number of women workers, and between 0.9 and 1.9% of all workers.[2] Consequently the number of adult women employed amounts to not more than 46% of the total labour force in these industries ; closer approximation is not possible.

The average weekly earnings of men, in July 1942, ranged from 76s. in Flax Spinning and Weaving and 78s. in Local Authorities' Services to 127s. in Shipbuilding and Repairing and 147s. in Motor Vehicle and Aircraft Manufacture and Repair, where earnings were 20s. higher than in any other of the 95 industrial sub-divisions. The last mentioned industries have experienced the greatest increases, about 80%, since 1938. Comparatively small increases, ranging from 29 to 44 per cent., have occurred in the Clothing industries ; while the smallest increase, for all classes of workers, has been in the Paper and Printing trades, the average increase for all workers in Printing, Publishing and Bookbinding being 22%.

Average earnings of women, at the same date, varied from 34s. a week in small Laundries and 35s. in Flax Spinning and Weaving to 69s. a week in Motor Vehicles and Aircraft and 69s. 6d. on Road Passenger Transport, where the increase in wages, of 90% since 1938, has apparently been greater than anywhere else. There was also a large increase, averaging 82%, in the Metal, Engineering and Shipbuilding industries.

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[1] It is explained that the average earnings for all workers together 'have been calculated by applying the total numbers employed in each industry to the average earnings of all the workers covered by the returns received for that industry.' Weights have not been applied to the averages for men, boys, women and girls in proportion to their relative numbers, so that if the returns were less representative for women than for men, which seems possible, the averages shown for all workers would be slightly too high. The proportionate numbers in the four sex and age groups in 1938 may be estimated, with fair precision, from the figures of insured persons in employment, to be as follows : men 59%, boys 14%, women 20½%, girls 6½%. If these percentages are applied to the averages in each group, the average earnings for all workers in October 1938 would be 52s. 3d., instead of 53s. 3d., as given. The comparison between two dates, where the same method is used for each, might not be affected.

[2] Half these proportions if part-time workers are counted as half full-time workers.

The highest earnings of boys appear in the group of Building industries, the average in Public Works Contracting being 72s. 9d. per week, or 9s. higher than in any other trade. Earnings of more than 55s. a week are found in only one other industry, Non-Ferrous Metal Manufacture, so that the high wages of young boys, sometimes mentioned, must relate to exceptional cases.

The average earnings of girls were less than 25s. a week in Pottery, the Flax industry, Retail Bespoke Tailoring and in Printing and Publishing. The highest wages of girls were 38½s. in Non-Ferrous Metals and Government Industrial Establishments and 39½s. in Motor Vehicle and Aircraft Manufacture.

It is evident that the highest, as well as the lowest, earnings of adults and young workers and of the different sexes are generally found in the same industries or trades. The average earnings of women were 49% of the men's average in July 1942, compared with 47% in October 1938, and the proportion varied very little from one industry to another, except in Road Passenger Transport, where women's wages were 70% of men's. Wage *rates* of women are generally about 60% of men's rates, so that they must have rather smaller opportunities of obtaining additional earnings from overtime, piecework or special bonuses. The average wages of boys were 38% of men's average earnings in 1938 and 41% in July 1942. Again, there was not much variation of this proportion in different industries, with the exception of Public Works Contracting, where the percentage was 68 at the later date. It would appear that a man, in general, is worth 2½ boys. The average earnings of girls in July last were 56% of women's earnings and 66% of boys'.

In view of the efforts which have been made to attract women into industry, and the ' further mobilisation of women into industry ' foreshadowed by the Minister of Production,[1] the earnings of women and the proportion to men's earnings do not seem very high, the relative increase since 1938 being slight.

The average earnings of men and women in the different industries show considerably greater variations in 1942 than in 1938 ; the smallest increases, in other words, have occurred in industries where, in general, wages were relatively low in 1938 and the largest increases where wages were relatively high. If the average earnings of men, in the sixteen industry groups, are expressed as percentages of the average in all these industries combined, in October 1938 and July 1942, the (unweighted) mean deviation about the average is found to have risen from about 7% to about 12%. For women's wages in the same industrial groups the (unweighted) mean deviation about the general average increased from about 8% to about 13%. For all workers together, the corresponding mean deviation shows a smaller change, being about 15% at both dates. If the deviations were weighted according to the proportions in the different industries, which at the later date are not known, the results might be slightly different.

Index numbers of the general average earnings for all industries included in the enquiries are shown below, for the four dates at which enquiries have been held since the beginning of the war, together with the Ministry of Labour's index of wage rates for the same industries.

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[1] Speech to House of Commons, 19th January 1943.

INDEX NUMBERS OF AVERAGE EARNINGS AND WAGE RATES.

(October 1938 = 100)

	July 1940	*July 1941*	*Jan. 1942*	*July 1942*
(*a*) Earnings (1938 industries)	127	137½	140½*	152½
(*b*) Earnings (current weights)	130	142½	148*	160
Wage Rates	110½	118	122	124

* adjusted for low earnings of builders, affected by weather.

The series marked (*b*) indicates the average earnings at each date shown, weighted by the numbers in the different industries and sex and age groups at that date, expressed as a percentage of average earnings in October 1938, the latter being weighted by the numbers in these groups in 1938. This series, therefore, shows the *increase in average earnings* and provides a unique index for any date.

It appears that the index marked (*a*), say for July 1942, has been obtained, in effect, by weighting the average earnings then received according to the proportions employed in the different industries in 1938 and according to the proportions in different sex and age groups in July 1942 ; the result being expressed as a percentage of average earnings in October 1938, weighted by the 1938 proportions in different industries and sex and age groups.[1] The difference between (*a*) and (*b*) shows the effect of the transference from lower to higher paid industries, apart from changes, the extent of which is not known, in the proportions of men, boys, women and girls in the total numbers employed.

On the other hand, neither of these index numbers shows the *average increase* in earnings, which would be obtained by applying the same system of weights to the earnings at both dates under comparison ; using either the numbers employed at the earlier date, or numbers at the later date, or some average of the two. Assuming that the above interpretation is correct,[2] it would be useful if the Ministry of Labour were to publish, in addition to the two series given at present, at least one index number showing the average increase in earnings. It is clear that an index of this type would indicate greater increases than the series (*a*), but it is not certain whether it would be greater or less than the series (*b*) ; and it would still depend, to some extent, on which system of weighting is chosen. It seems safe to assume that, in the industries included in the Ministry of Labour's enquiries, the average increase in earnings, between October 1938 and July 1942, would be between 55 and 60%, if weights were taken as proportional to the average numbers employed at the two dates.[3]

As regards the industries excluded from the enquiries, the average earnings per shift of adult workers in coal mining were 15s. 8d. in the last quarter of 1941, and the increase of 2s. 6d. in June 1942 would bring this to 18s. 2d., or about 61% above the 1938 level. No other figures of earnings are available. But in agriculture, average wage rates, since the establishment of the 60s. minimum, are 73% above the pre-war level, while normal working hours, beyond which overtime rates are payable, have mostly been reduced. Average wage rates of railwaymen (traffic workers) in July 1942 were 21% above the pre-war rates while opportunities for overtime on the railways appear to have increased less than elsewhere.

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[1] This is not clearly stated in the Ministry of Labour's published accounts of the earnings enquiries but it may be confirmed by weighting the average earnings of all workers in the different industries in July 1942, which are based on the numbers then employed in the different age and sex groups, with the total number of workers employed in these industries in 1938 ; the result is the same as index (*a*).

[2] A different interpretation was previously given to series (*a*) which is now believed to have been incorrect. *cf.* BULLETIN Vol. 4, No. 17, p. 324. The final results given there were based on provisional estimates, but the later information would involve only slight changes.

[3] Since this article was written, it has been learned from the Ministry of Labour, who kindly granted permission for publishing the information, that if 1938 weights were applied, both by industries and by sex and age groups, the average increase in

Assuming that earnings in the last named industries have risen more than rates, the average increase in earnings, between October 1938 and July 1942, for all the main industries together,[1] may be estimated at between 56 and 62%.

J. L. NICHOLSON.

TAXATION OF TOBACCO, BEER AND CINEMA ATTENDANCES.

'The success of a war-time budget must be judged not so much by the amount of revenue it raises as by the way in which it serves to concentrate the national effort on the war.' Among the principal changes which the last budget—thus commented upon by Sir Kingsley Wood—brought about, were big increases in the taxes on tobacco, beer and entertainment. Their declared object was to enable the Chancellor to 'help through taxation his colleagues to keep demand and supply in better equilibrium.'[2] Since last April sufficient time has passed to justify an attempt to analyse how far and in what way the fiscal measures then adopted have achieved this aim.

1. The flat increase in the rate of customs duty on tobacco brought about a greater percentage increase in the duty for Empire tobacco than in the case of foreign tobacco; the weighted average increase was 53%. The average rate of excise duty on beer is 40% higher in the current financial year than the rate prevailing in 1941/42).[3] On the other hand, estimates of tax receipts in a full year in the 'Financial Statement' show a rise of 40.5% for tobacco and of 29.5 % for beer. Thus the authorities allowed for a fall in consumption in both cases by about 8%. This figure may be taken as an indication of the result that was expected from the operation of the price deterrent, i.e. from an increase in the average price of tobacco by about 36% and of beer by about 22%.[4]

Consumption figures that have since been published give a different picture. During the six months April to September 1942 the output of beer, though lower than in the first quarter of 1942, was about at the level prevailing in the same period of the preceding year, and the same

earnings between October 1938 and July 1942 would be about 54%. The figure would be higher if 1942 weights were used, because changes in the numbers employed are correlated with changes in earnings, so that our results are hardly affected.

[1] This excludes shipping service, distribution, catering and domestic services.

[2] Sir Kingsley Wood: *Times*, April 15, and *Hansard* April 14, 1942.

[3] In the last Budget excise duty on beer was raised by 45.5%; as gravity was lowered in Jan. 1942, the average rate of duty which depends on gravity, did not rise between the two financial years to the full extent of the increase in tax.

[4] Prices were only raised by the amount of the additional duty. Therefore, the percentage rise in prices is less than the percentage rise in duty,

probably holds true of the amount of tobacco retained for home consumption (releases from bond minus drawbacks).[1] If the rising trend of consumption prevails in the current financial year to a similar extent as it did in 1941/42, consumption in the full year may well be maintained —in spite of higher prices—at the 1941/42 level, instead of the expected fall by 8%. As will be shown later, there are strong reasons for assuming that this will be the case, in view of the continuing rise in the real income.

2. Similar computations for the entertainments duty are somewhat more difficult because consumption data are only available for cinema attendances, whereas figures of tax receipts refer to all entertainments. Since, however, nearly 90% of the yield of entertainments duty comes from attendance at cinemas,[2] the revenue from cinemas can be expected to vary in a similar way as total revenue from entertainments duty.

In the ' Financial Statement ' the yield of entertainments duty was estimated to rise by 87%, against an average rise in duty on cinema seats of 95%.[3] Unless considerable shifts between cinema attendances and other entertainments were anticipated the conclusion may be drawn that the authorities expected a fall in cinema attendances of about 4% consequent upon the increase in duty and the rise in exhibitors' charges which was then already under consideration.

What actually happened was again somewhat different from expectations. The combined effect of increases in tax and in exhibitors' charges to the public raised prices of cinema tickets by between 33 and 50 per cent. ; yet recent speeches by the chairmen of the more important cinema circuits suggest that attendances are still rising, above the record level of 27 million attendances a week reached in the past financial year.

3. The explanation of such unusual reactions of the consumer seems to lie in the fact that demand for mass luxuries is not so much determined by price as by income. Price rises may be accompanied by increased consumption if income is rising. It can be shown that in the period 1924—1938 there was a close correlation between the real wage bill on the one hand and the consumption of tobacco or beer on the other. The relationship between the real wage bill and tobacco consumption can be expressed by the equation

$$y=47.1+0.06474x+2.349t$$

where x is the wage bill as computed by Professor Bowley,[4] in million £, deflated by the cost of living index (adjusted for the omission of services)[5] t is the number of years after 1931 and y the amount of tobacco retained for home consumption (in million lbs.). The corresponding equation for beer is

$$z= -23.6 + 0.02951x - 1.055t$$

where z is the quantity of beer consumed (home production plus net imports, in million bulk barrels), while x and t have the same meaning as before. Thus over the period considered, a rise—or fall—in the real wage bill by £10 million had a tendency to raise—or lower—tobacco consumption by about 0.65 million lb. and beer consumption by about 0.3 million bulk barrels. Moreover, on account of long term changes in demand and in the real wage-bill, consumption of tobacco tended to increase by 2.3 million lb. a year and that of beer tended to fall by about 1.1 million bulk barrels. Both factors together, the course of the real wage bill and the trends, account fairly well, as can be seen from the accompanying diagram, for observed changes in actual consumption, or, in other words, values computed from trend and the real wage bill lie very close to observed values of consumption. The coefficient of multiple correlation adjusted for the size of the sample and the number of variables, is 0.97 for tobacco and 0.91 for beer.[1] Moreover, there appears to be a lag of consumption behind income ; the graph of consumption computed from the wage-bill, falls and rises earlier than the graph of actual consumption.

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[1] Consumption in the first quarter of the current financial year was 5% higher than in the same period of last year.

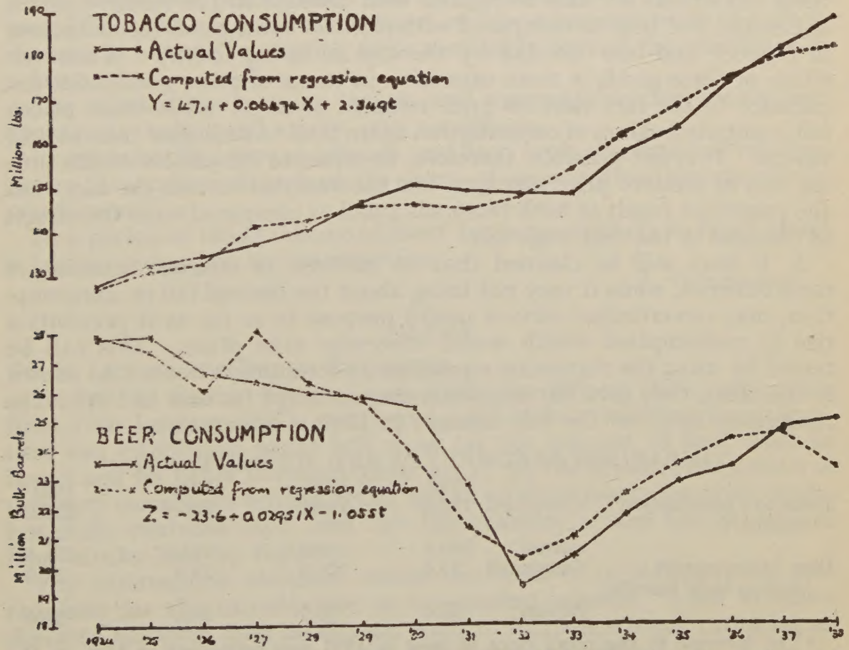
[2] Sir Kingsley Wood, Budget Speech, 14th April 1942.

[3] Tax was raised by 100% on all seats except those at 7d. or less for which the rate was left unchanged. Such seats were estimated to account for about 5% of the 1941/42 yield of entertainments duty from cinemas. (Viz. Sir Kingsley Wood, *Hansard*, June 4th, 1942, column 811.)

[4] ' Studies in National Income,' p. 58.

[5] A constant value was added to the official index throughout the period to allow for expenditure on services as ascertained in the Ministry of Labour Budget Enquiry 1937/38.

There were few price changes in the period under consideration.[2] In September 1931 the beer duty was raised by slightly less than 1d. per pint on the average, with a similar increase in average prices, and it was



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[1] For the mean values of income and consumption, the income elasticity of demand is .69 for tobacco and 1.98 for beer, which means that an increase (or decrease) in the wage bill of 1% tended to bring about an increase (or decrease) of .69% in tobacco consumption and of 1.98% in beer consumption.

[2] Tobacco prices were slightly raised in 1927 and 1931. It appears that these changes were either too small to affect the consumer or that they were counteracted by shifts in demand to cheaper brands. The deviations between computed and actual consumption in 1927 and 1931 are due to the effect of the time lag. (See below Section 4.).

lowered again in April 1933 so as to allow a reduction in retail prices by 1d. Yet the effect of these price changes on consumption was not very large. Beer consumption in 1932, the first full year after the rise, was only about 5% below the level corresponding to trend and wage bill, (see diagram). In other words, in spite of the rise in prices, consumption was only 5% lower than it would have otherwise been.[1] The remission of duty in 1933 and the consequent fall in price restored consumption to the level corresponding to trend and wage-bill. Throughout the period 1933—1936 computed values are higher than actual values because of the effect of the time lag ; the upswing in the wage bill, from which the computed values are obtained, started earlier than the upswing in consumption.[2]

4. If the deviations of computed from actual values are further analysed it is found that they are closely correlated with changes in the real wage-bill from one year to the other. Whenever there is an increase in the real wage-bill as compared with the previous year, the computed value of consumption (which takes into account the level of the real wage-bill only in the current year) tends to be too high, and vice versa. This would agree with the assumption of a time lag between income and consumption. On the other hand, throughout the cycle 1930—1938 these deviations are also correlated with changes in the relative prices of tobacco and beer as compared with prices of other goods (actual prices of tobacco and beer divided by the cost of living index). Whenever either of these goods is more expensive in terms of other goods, due for instance to the fact that its price remains constant while other prices fall, computed values of consumption again tend to be higher than actual values. It is not possible, therefore, to separate the effects of the time lag and of relative price changes, but the analysis reveals the fact that the combined result of both factors is small as compared with the effects of changes in the real wage-bill.

5. It may still be claimed that an increase in indirect taxation of mass luxuries, while it may not bring about the desired fall in consumption, may nevertheless serve a useful purpose in so far as it prevents a rise in consumption which would otherwise take place. This can be tested by using the regression equations as computed above. As shown in the table, they give fair approximations, except for beer in 1941 ; the temporary effect of the tax changes in 1940 is apparent.

COMPARISON OF COMPUTED AND ACTUAL VALUES.[3]

		1938	1939	1940	1941
Tobacco Consumption : (million lb.)	Computed	182.9	193.0	206.4	222.2
	Actual	189.4	199.0	191.0	221.5
Beer Consumption : (million bulk barrels)	Computed	23.4	25.9	29.9	34.9
	Actual	25.0	26.5	26.5	30.0

[1] The increase in the retail price of beer in 1931 was estimated at 17% in the *Brewers' Almanack* 1938, p. 32, and at 8% in G. B. Wilson, ' Alcohol and the Nation,' p. 422.

[2] Lack of data makes the corresponding computation for cinema attendances impossible. But the figures relating to the yield of entertainment tax clearly indicate —after a rough elimination of the effects of changes in taxation—that a similar relationship exists between income and consumption as in the other two cases.

[3] Consumption figures see BULLETIN Vol. 4, N.o 12, page 243 and No. 15 p. 287, plus estimates for imports of beer, from the Financial Statement. The wage bill series

The agreement between computed and actual values would suggest that the linear correlation between income and consumption which was established for the previous period, is still operative under war conditions and that consumption is not very far from the level corresponding to the increase in the real wage bill and the influence of the trend, in spite of the considerable increases in taxation in 1939 and 1940.[1] The estimates of consumption are, however, less reliable for the years of war than for the previous period because of changing circumstances, especially Government restrictions on the supply of tobacco and beer, and shortages of other goods.

In so far as the latest increases in taxation had some influence on consumption, insignificant as it will probably be in the long run, it may be assumed that their impact was greatest among the low income classes, in view of the regressive character of the tax and price changes consequent upon the 1942 Budget. While, for instance, better class cigarettes rose in price by 33%, the rise in cheaper cigarettes amounted to 38%. A shilling seat in cinemas went up by 50%, whereas a 2/6 ticket now costs 3/-, a rise of only 20%.

7. The result of the present inquiry may be summarised as follows:

In the pre-war period there was a close correlation between the real wage-bill on the one hand and tobacco or beer consumption on the other, changes in income accounting for a very large part of the variations in consumption.

The relationship between income and consumption thus established appears to hold good under war conditions.

Changes in the prices of tobacco and beer, both absolute and relative, have a far smaller influence on the course of consumption than changes in real income.

In a period of rising income indirect taxes are unlikely to bring about a lasting reduction in consumption.

J. GOLDMANN.

DIARY

FLOUR CENSUS AND BREAD RATIONING

Under the Bread (Control and Maximum Prices) Order, operative from 17th January, 1943, a current census of flour and bread consumption was established which will show (*a*) the amount of flour used in bread and for other purposes (cake, etc.); (*b*) the bread consumption of ordinary consumers buying retail and of establishments (catering trade, hospitals, canteens etc.), and (*c*) the quantity of and the changes in flour stocks held by bakers.

The information obtained under the Order is an indispensable prerequisite for the introduction of a rationing scheme. Lord Woolton declared however, that he did not want to introduce bread rationing at this stage and appealed again for voluntary economies.

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was extended by using the estimates of the White Paper Cmd. 6347. For 1939 the rise in the wage bill was estimated on the basis of changes in employment and wage rates. The cost of living index for the war period was taken from J. L. Nicholson 'The Burden of the War,' BULLETIN Vol. 4, No. 8, page 168.

[1] There is, of course, the possibility that a new relationship obtains between income and consumption and that a chance collection of war-time factors resulted in values of consumption which roughly correspond to values computed from the peace-time correlation, although this would seem rather unlikely.

Annual wheat imports before the war were of the order of 5 million tons; wheat consumption was about 6½—7 million tons. Bread consumption has increased since but wheat consumption for other purposes may have been cut while wheat production at home has increased. Flour extraction ratios have been raised and more recently other homegrown grains were admixed to bread. The net result of these changes is difficult to estimate, but it would be surprising if the balance of bread stuff required for current consumption to be met by current imports were running at a rate of less than 3 million tons per annum.

The present weekly bread consumption per person may be put at 3½ to 4 lb.[1]; a population of 46 millions would therefore consume 4.2 to 4.8 million tons of bread a year. Assuming a flour content of 66% of the weight of bread the total amount of flour used for bread production would be 2.8 to 3.1 million tons. Flour consumed in households may be estimated at the basis of, say .5 to .75 lbs. a week per person or .5 to .7 million tons per year, and the flour consumed in cake and biscuits (average weekly consumption 10 or 12 ozs. and assuming a flour content of 40%) may be put at .3 to .4 million tons. Aggregate flour consumption for the uses enumerated would therefore, on a conservative estimate, amount to 3.5 to 4.0 million tons. Assuming at least 15% loss in offals in the conversion process from grain into flour and allowing a margin of 10% for wasted wheat, the minimum figure for wheat consumption would be 4¾ to 5 million tons. This estimate, however, takes no account of a great variety of other uses (e.g. wheaten breakfast cereals) and of other users of wheat (catering establishments, etc.), and may well be 1 million tons or more too low. Thus considerable savings could be obtained by reducing wheat consumption other than for bread.

Only after these economies have been exhausted could cuts in the flour supply for bread production be considered. Such a cut could take two forms: part substitution of potato flour for wheat flour without restrictions of supply, or bread rationing, which would also divert demand to potatoes. The choice between the two methods of wheat economy will depend among other things on the following considerations.

A 10% admixture of potato flour to bread would require, say 500,000 tons potato flour in addition to the amount used hitherto. If the mixed bread 'keeps' and remains palatable, and if bakers are sufficiently instructed in adopting the baking process to the admixture, the costs in real home resources are the decisive factor. They will be greater if reserve plant for the necessary increment in output is not available—which is almost certainly the case—or if more nutritive values are lost in the conversion process than in the household use of potatoes.

Bread rationing involving a noticeable cut in wheat bread consumption could for reasons of equity only be introduced on a differential basis, giving higher rations to manual workers or special categories of workers than to the sedentary workers and, if necessary, more to adolescents and adults than to children. Such a scheme—officially hinted at as a possibility—would imply differential inducements to substitute potatoes for bread in households. No industrial or 'gainfully employed' labour is required to convert potatoes into food in the household.

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[1] Soldiers allowance 70 oz., A.T.S. 56 ozs., Working Class families according to the Institute Budget Inquiry (BULLETIN Vol. 4, Supplement No. 3. p. 8) 62 ozs.